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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/042,927 | 01/09/2002 | Henryk Birecki | 10004242-1 | 4533 |

7590 12/17/2003

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

ROSE, KIESHA L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2822

DATE MAILED: 12/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/042,927

Applicant(s)

BIRECKI ET AL.

Examiner

Kiesha L. Rose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the amendment filed 22 September 2003.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chalamala et al (6,091,190).

Chalamala teaches a structure for an electron emission device having a emitter electrode having a Schottky barrier, the emitter being metal layer 118 a metal such as molybdenum (see column 3, lines 5+) and a Schottky passivation layer (semiconductor layer) such as oxides of Ba, Ca, In, Sc, Ti, Ir, Co, Sr, Y, Zr, Ru, Pd, Sn, Lu, Hf, Re, La, Ce, Pr, Nd, Pm, Sm, Eu, Ge, Tb, Dy, Ho, Er, Tm, Yb, Th (see column 2 lines 40+). The key to the invention is that understood to be that the passivation oxide must be lower in work function than that of the metal layer (see column 2 lines 34+). Chalamala also provides for gate electrodes (extractor electrodes) 116. It would have been obvious to a skilled artisan to use any metal in combination with the passivant as long as the passivant is of lower work function. For example in column 1 includes other metals including titanium,

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hafnium and gold as functionally equivalent with molybdenum. If Applicant wishes to maintain patentability of Ti over its functional equivalents of Pt, W, Mo, Ti, Cu, Au, Ag, Ta, etc, the Applicant needs to address the criticality of this metal as opposed the Applicant's specification which lists all of these metals as suitable functional equivalents.

Claims 2, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chalamala as applied to claims 1, 3-5 and 8 above, and further in view of Christensen (4,663,559).

Christensen teaches both anode electrodes 26 (i.e. extractor electrodes) and the additional focusing electrodes 16. Note Christensen also teaches a flattened emission electrode as opposed to the tipped electrode of Chalamala. It would have been obvious to combine the teachings of Chalamala with the advantages of the materials for emission with the improved design of Christensen's focusing electrodes in order to have controlled beam emission. Also, the flattened emission electrode is a design choice that renders fabrication easier.

Response to Arguments

Applicant's arguments filed 22 September 2003 have been fully considered but they are not persuasive. Applicant argues that the new amendment overcomes the Chalamala reference regarding the emitter being formed of a Schottky metal and a semiconductor layer, whereas the prior art still discloses the claimed limitations by the emitter 221 having a Schottky metal

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(118) and a semiconductor layer (220) formed over metal layer, therefore the rejection stands. In addition applicant argues that the reference does not disclose the semiconductor layer to be formed of TiO_2 , whereas the reference states all the materials it can be formed of and they are all the oxides of the material (Abstract) so the semiconductor layer being formed of TiO_2 is disclosed. Therefore the rejections stand.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is


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571-272-1844. The examiner can normally be reached on M-F 8:30-6:00 off 2nd Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


KLR


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